

What is claimed is:

1 1. An atomizer system comprising:
2 a) a melt material to be atomized;
3 b.) a containment portion for securing the melt material;
4 c.) a unit which accelerates the environment of the melt material such
5 that the gravitational forces experienced by the melt material are elevated
6 relative to Earth's standard gravitational force; and
7 d.) atomizing fluid that flows across an exposed surface of the melt
8 material facilitating the establishment of liquid droplets that aerosolize and create
9 fine particulates.

1 2. The atomizer system of claim 1 further comprises means to
2 introduce relative motion between the containment portion and the melt material.

1 3. The atomizer system of claim 2 wherein elements of the atomizer
2 system rotate on more than one axis.

1 4. The atomizer system of claim 3 wherein the containment portion
2 spins as a liquid melt material is introduced into it.

1 5. The atomizer system of claim 3 wherein the melt material is
2 exposed to an acceleration that has components both normal and perpendicular
3 to a retaining surface of the containment portion.

1 6. The atomizer system of claim 1 wherein the unit accelerating the
2 environment of the melt material is a centrifuge.

1 7. The atomizer system of claim 1 further comprising a source of
2 vibration to introduce disturbances within the melt material.

1 8. The atomizer system of claim 1 wherein the flow of atomization fluid
2 is non-continuous.

1 9. The atomizer system of claim 1 wherein the containment portion is
2 made of a solid form of the melt material itself.

1 10. The atomizer system of claim 1 is capable of processing entrained
2 (non-dissolved) fluid within the melt material to facilitate atomization for at least a
3 portion of the overall atomization process.

1 11. The atomizer system of claim 1 wherein the atomizing fluid is a gas.

1 12. The atomizer system of claim 11 wherein the gas that is the
2 atomizing fluid is inert.

1 13. The atomizer system of claim 11 wherein the gas that is the
2 atomizing fluid is oxidizing.

1 14. The atomizer system of claim 11 wherein the gas that is the
2 atomizing fluid is reducing.

1 15. The atomizer system of claim 1 wherein the atomizing fluid is a
2 liquid.

1 16. The atomizer system of claim 15 wherein the liquid that is the
2 atomizing fluid is inert.

1 17. The atomizer system of claim 15 wherein the liquid that is the
2 atomizing fluid is oxidizing.

1 18. The atomizer system of claim 15 wherein the liquid that is the
2 atomizing fluid is reducing.

1 19. The atomizer system of claim 1 wherein the atomizing fluid contains
2 particulates therein.

1 20. The atomizer system of claim 1 wherein the thermodynamic
2 conditions, i.e. temperature, pressure, and density, as well as velocity (axial and
3 angular) of the atomizing fluid are user selectable.

1 21. The atomizer system of claim 1 further comprising a cooling
2 system.

1 22. The atomizer system of claim 1 further comprising a liquefying
2 system that subjects the material to be melted to elevated acceleration prior to
3 liquefying.

1 23. The atomizer system of claim 22 wherein the operation of the
2 liquefying system is non-continuous.

1 24. The atomizer system of claim 22 wherein the liquefying system
2 applies radiant heating to the melt material to be atomized.

1 25. The atomizer system of claim 22 wherein the liquefying system
2 applies induction heating to the melt material to be atomized.

1 26. The atomizer system of claim 22 wherein the liquefying system
2 applies electric arc heating to the melt material to be atomized.

1 27. The atomizer system of claim 22 wherein the liquefying system
2 applies lasers to the melt material to be atomized.

1 28. The atomizer system of claim 22 wherein the liquefying system
2 applies hot atomizing fluid heating to the melt material to be atomized.

1 29. The atomizer system of claim 22 wherein the liquefying system
2 applies chemical reaction heating to the melt material to be atomized.

1 30. The atomizer system of claim 22 wherein the liquefying system
2 applies refractory containment heating to the melt material to be atomized.

1 31. The atomizer system of claim 22 wherein the liquefying system
2 applies plasma arc heating to the melt material to be atomized.

1 32. A method of atomizing a material comprising the steps of:
2 a.) accelerating the environment of the material to be atomized such
3 that the gravitational forces experienced by the material are elevated relative to
4 Earth's standard gravitational force; and
5 b.) flowing an atomizing fluid across an exposed surface of the
6 material facilitating the establishment of liquid droplets which aerosolize and
7 create fine particulates.

1 33. The atomizer method of claim 32 further comprises the step of
2 introducing relative motion between the containment portion and the melt
3 material.

1 34. The atomizer method of claim 33 further comprises the step of
2 rotating the atomizer system on more than one axis.

1 35. The atomizer method of claim 33 further comprises the step of
2 spinning the containment portion while introducing the liquid melt material into it.

1 36. The atomizer method of claim 33 further comprises the step of
2 exposing the melt material to an acceleration that has both normal and
3 perpendicular components to the retaining surface of the melt containment
4 portion.

1 37. The atomizer method of claim 32 further comprises the step of
2 accelerating the environment of the melt material in a centrifuge.

1 38. The atomizer method of claim 32 further comprises the step of
2 introducing a source of vibration to facilitate disturbances within the melt material.

1 39. The atomizer method of claim 32 further comprises the step of
2 controlling a non-continuous flow of atomization fluid.

1 40. The atomizer method of claim 32 further comprises the step of
2 containing the melt material with a containment portion made of a solid form of
3 the melt material itself.

1 41. The atomizer method of claim 32 further comprises the step of
2 processing entrained (non-dissolved) fluid within the melt material to facilitate
3 atomization for at least a portion of the overall atomization process.

1 42. The atomizer method of claim 32 wherein the atomizing fluid is a
2 gas.

1 43. The atomizer method of claim 42 wherein the gas that is the
2 atomizing fluid is inert.

1 44. The atomizer method of claim 42 wherein the gas that is the
2 atomizing fluid is oxidizing.

1 45. The atomizer method of claim 42 wherein the gas that is the
2 atomizing fluid is reducing.

1 46. The atomizer method of claim 32 wherein the atomizing fluid is a
2 liquid.

1 47. The atomizer method of claim 46 wherein the liquid that is the
2 atomizing fluid is inert.

1 48. The atomizer method of claim 46 wherein the liquid that is the
2 atomizing fluid is oxidizing.

1 49. The atomizer method of claim 46 wherein the liquid that is the
2 atomizing fluid is reducing.

1 50. The atomizer method of claim 32 wherein the atomizing fluid
2 contains particulates therein.

1 51. The atomizer method of claim 32 further comprises the step of the
2 user selecting the thermodynamic conditions, i.e. temperature, pressure, and
3 density, as well as velocity (axial and angular) of the atomizing fluid.

1 52. The atomizer method of claim 32 further comprises the step of
2 cooling at least one component of the atomizer.

1 53. The atomizing method of claim 32 further comprising the step of
2 subjecting the material to be liquefied to the intended acceleration prior to being
3 liquefied.

1 54. The atomizing method of claim 53 wherein the step of liquefying the
2 melt material is non-continuous

1 55. The atomizing method of claim 53 wherein the liquefying step
2 applies radiant heating to the melt material to be atomized.

1 56. The atomizing method of claim 53 wherein the liquefying step
2 applies induction heating to the melt material to be atomized.

1 57. The atomizing method of claim 53 wherein the liquefying step
2 applies electric arc heating to the melt material to be atomized.

1 58. The atomizing method of claim 53 wherein the liquefying step
2 applies lasers to the melt material to be atomized.

1 59. The atomizing method of claim 53 wherein the liquefying step
2 applies hot atomizing fluid heating to the melt material to be atomized.

1 60. The atomizing method of claim 53 wherein the liquefying step
2 applies chemical reaction heating to the melt material to be atomized.

1 61. The atomizing method of claim 53 wherein the liquefying step
2 applies refractory containment heating to the melt material to be atomized.

1 62. The atomizing method of claim 53 wherein the liquefying step
2 applies plasma arc heating to the melt material to be atomized.